ATTACHMENT C
RESOLUTION NO.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM

FOR
CITY OF ROSEVILLE
DIAMOND CREEK WELL
PHASE II DEMONSTRATION AQUIFER STORAGE AND RECOVERY PROJECT
PLACER COUNTY

This monitoring and reporting program (MRP) incorporates requirements for monitoring of treated injection water and groundwater, and is issued in conjunction with Waiver Resolution No. _____. This MRP is issued pursuant to California Water Code Section 13267. All samples shall be representative of the volume and nature of the discharge. The time, date, and location of each grab sample shall be recorded on the sample chain of custody form.

TREATED INJECTION WATER MONITORING

Injection water from the City of Roseville's Water Treatment Plant (WTP) will be tested immediately prior to injection to establish baseline concentrations, and during the injection cycle. The baseline sampling shall consist of two WTP sampling events. These events shall be at least one week apart. Samples shall be analyzed for the constituents tabulated below. Samples shall be collected from an established sampling station located in an area that will provide representative samples. Injection water monitoring shall include at least the following:

Constituent	Units	Type of Sample	Sampling Frequency
pH	std.	Grab	Weekly[8], Bi-monthly[9], Monthly[10], Other[11]
Dissolved Organic Carbon	mg/L	Grab	Weekly[8], Bi-monthly[9], Monthly[10], Other[11]
Total Kjeldahl Nitrogen	mg/L	Grab	Other[11]
Total Dissolved Solids	mg/L	Grab	Weekly[8], Bi-monthly[9], Monthly[10], Other[11]
Standard Minerals[1]	mg/L	Grab	Weekly[8], Bi-monthly[9], Monthly[10], Other[11]
Chlorine Residual	mg/L	Grab	Weekly[8], Bi-monthly[9], Monthly[10], Other[11]
Ammonia	mg/L	Grab	Weekly[8], Bi-monthly[9], Monthly[10], Other[11]
Boron	mg/L	Grab	Other[11]
Fluoride	mg/L	Grab	Other[11]
Iron	mg/L	Grab	Other[11]
Manganese	mg/L	Grab	Other[11]
Molybdenum	mg/L	Grab	Other[11]
Anion Scan[2] (EPA 300)	mg/L	Grab	Other[11]
Trace Metals[3] (EPA 6010B)	mg/L	Grab	Other[11]
Antimony (EPA 7062)	mg/L	Grab	Other[11]
Arsenic (EPA 7062)	mg/L	Grab	Other[11]
Cadmium (EPA 7131A)	mg/L	Grab	Other[11]
Lead (EPA 7421)	mg/L	Grab	Other[11]
Mercury (EPA 7471A)	mg/L	Grab	Other[11]

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Constituent	Units	Type of Sample	Sampling Frequency
Nickel (EPA 7521)	mg/L	Grab	Other[11]
Selenium (EPA 7742)	mg/L	Grab	Other[11]
Thallium (EPA 7841)	mg/L	Grab	Other[11]
Trihalomethanes[4] (EPA 8260B)	mg/L	Grab	Weekly[8], Bi-monthly[9], Monthly[10], Other[11]
Haloacetic Acids[4] (EPA 8260B)	mg/L	Grab	Weekly[8], Bi-monthly[9], Monthly[10], Other[11]
Volatile organics[5](EPA 8260B)	mg/L	Grab	Other[11]
Semi-volatile organics[5] (EPA 8270C)	mg/L	Grab	Other[11]
Organochlorine Pesticides[5] (EPA 8141A)	mg/L	Grab	Other[11]
N-Nitrosodimethylamine[6]	µg/L	Grab	Other[11]
Total Coliform Organisms[7]	MPN/10 0 ml	Grab	Other[11]

[1] Standard Minerals shall include the following: calcium, magnesium, potassium, sodium, total alkalinity (including alkalinity series), and hardness.
[2] Anion scan shall include the following: bromide, chloride, nitrate (as N), nitrite (as N), phosphate, sulfate, sulfite.
[3] Trace metal scan shall include the following: barium, beryllium, chromium, cobalt, copper, silver, tin, vanadium, zinc.
[4] Individual trihalomethane and haloacetic acid constituent concentrations shall be monitored and reported.
[5] All analytical peaks shall be identified and their concentrations reported.
[6] Using California DHS approved sampling and analysis methods and quantitation limits consistent with DHS Detection Limits for Purposes of Reporting (DLRs).
[7] Using a minimum of 15 tubes or three dilutions
[8] Weekly sampling conducted during the first and last weeks of the injection cycle.
[9] Bi-monthly sampling conducted for the second sample during the injection cycle.
[10] Monthly sampling conducted during the final 5 months of the injection cycle following the weekly sampling.
[11] Two additional samples to be collected 1 week prior to the injection cycle to establish baseline conditions.

GROUNDWATER MONITORING

Groundwater monitoring and sampling shall be conducted in accordance with the 10 June 2003 Sampling and Analysis Plan (SAP) and the information provided in the 15 May 2005 RWD, except as specified below.

Prior to initiating the test, baseline sampling from two groundwater sampling events shall be conducted in the Diamond Creek Well and each of the three monitoring wells. These events shall be at least one week apart. Samples shall be analyzed for the constituents and using the methods tabulated below. Groundwater samples shall also be collected from each of the monitoring wells during the entire length of the testing program, and in the Diamond Creek Well during the storage, extraction, and post-extraction cycles. Samples obtained from the Diamond Creek Well shall not be filtered prior to analysis. Groundwater sampling shall include the following constituents:

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Constituent	Units	Type of Sample	Sampling Frequency
Depth to Groundwater	0.01 feet	Measurement	Weekly[9], Bi-monthly[10], Monthly[11]
Groundwater Elevation[1]	0.01 feet	Calculated	Weekly[9], Bi-monthly[10], Monthly[11]
Gradient	feet/feet	Calculated	Weekly[9], Bi-monthly[10], Monthly[11]
pH	Std.	Grab	Weekly[9], Bi-monthly[10], Monthly[11]
Dissolved Organic Carbon	Mg/L	Grab	Weekly[9], Bi-monthly[10], Monthly[11]
Total Kjeldahl Nitrogen	Mg/L	Grab	Other[12]
Total Dissolved Solids	Mg/L	Grab	Weekly[9], Bi-monthly[10], Monthly[11]
Standard Minerals[2]	Mg/L	Grab	Weekly[9], Bi-monthly[10], Monthly[11]
Chlorine Residual	Mg/L	Grab	Weekly[9], Bi-monthly[10], Monthly[11]
Ammonia	Mg/L	Grab	Weekly[9], Bi-monthly[10], Monthly[11]
Boron	Mg/L	Grab	Other[12]
Fluoride	Mg/L	Grab	Other[12]
Iron	Mg/L	Grab	Other[12]
Manganese	Mg/L	Grab	Other[12]
Molybdenum	Mg/L	Grab	Other[12]
Anion Scan[3] (EPA 300)	Mg/L	Grab	Other[12]
Trace Metals[4] (EPA 6010B)	Mg/L	Grab	Other[12]
Antimony (EPA 7062)	Mg/L	Grab	Other[12]
Arsenic (EPA 7062)	Mg/L	Grab	Other[12]
Cadmium (EPA 7131A)	Mg/L	Grab	Other[12]
Lead (EPA 7421)	Mg/L	Grab	Other[12]
Mercury (EPA 7471A)	Mg/L	Grab	Other[12]
Nickel (EPA 7521)	Mg/L	Grab	Other[12]
Selenium (EPA 7742)	Mg/L	Grab	Other[12]
Thallium (EPA 7841)	Mg/L	Grab	Other[12]
Trihalomethanes[5] (EPA 8260B)	Mg/L	Grab	Weekly[9], Bi-monthly[10], Monthly[11]
Haloacetic Acids[5] (EPA 8260B)	Mg/L	Grab	Weekly[9], Bi-monthly[10], Monthly[11]
Volatile organics[6] (EPA 8260B)	Mg/L	Grab	Other[12]
Semi-volatile organics[6] (EPA 8270C)	Mg/L	Grab	Other[12]
Organochlorine Pesticides[6] (EPA 8141A)	Mg/L	Grab	Other[12]
N-Nitrosodimethylamine[7]	µg/L	Grab	Other[12]
Total Coliform Organisms[8]	MPN/100 ml	Grab	Other[12]

[1] Groundwater elevation shall be determined based on depth-to-water measurements from a surveyed measuring point elevation on the well.

[2] Standard Minerals shall include the following: calcium, magnesium, potassium, sodium, total alkalinity (including alkalinity series), and hardness.
[3] Anion scan shall include the following: bromide, chloride, nitrate (as N), nitrite (as N), phosphate, sulfate, sulfite.
[4] Trace metal scan shall include the following: barium, beryllium, chromium, cobalt, copper, silver, tin, vanadium, zinc.
[5] Individual trihalomethane and haloacetic acid constituent concentrations shall be monitored and reported.
[6] All analytical peaks shall be identified and their concentrations reported.
[7] Using California DHS approved sampling and analysis methods and quantitation limits consistent with DHS Detection Limits for Purposes of Reporting (DLRs).
[8] Using a minimum of 15 tubes or three dilutions
[9] Weekly sampling conducted during the first and last weeks of the injection cycle, during the first 3 and last weeks of the storage cycle, and during the first 3 weeks of the extraction cycle.
[10] Bi-monthly sampling conducted for the second sample and during the last 2 months of the injection cycle, and months 2 through 4 of the storage cycle.
[11] Monthly sampling conducted during months 2 through 4 of the injection cycle, during months 2 through 11 of the extraction cycle, and for both samples during post-test sampling.
[12] Additional samples to be collected 1 week prior to the injection cycle, after 2 months of storage, prior to the extraction cycle, immediately following the end of the extraction cycle, and one month after the end of the extraction cycle.

REPORTING

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, sample type, and reported analytical result for each sample are readily discernible. The data shall be summarized in such a manner to clearly illustrate compliance with the waiver.

As required by the California Business and Professions Code Sections 6735, 7835, and 7835.1, all Groundwater Monitoring Reports shall be prepared under the direct supervision of a Registered Engineer or Geologist and signed/stamped by the registered professional.

Monitoring reports shall be submitted to the Regional Board **every 60 days** following initial testing. A reporting schedule shall be submitted to the Regional Board with the first groundwater monitoring report. The monitoring reports shall discuss the water sampling and analytical results associated with the ASR demonstration testing, summarize important findings of the cycle monitoring relevant to the conditions of this waiver, and clearly evaluate and discuss compliance with the conditions of this waiver. Monitoring reports shall include the following information:

1. Locations of injection well, monitoring wells and any other sampling stations;
2. Results of the treated injection water and groundwater monitoring data;
3. Cumulative data tables;
4. A narrative description of all preparatory, monitoring, sampling, and analytical testing activities for the treated injection water and groundwater monitoring. The narrative shall be sufficiently detailed to verify compliance with the waiver;
5. Determination of groundwater gradient, area of influence, and impact to groundwater quality for all monitoring events;
6. A comparison of pre-test baseline groundwater monitoring data and applicable water quality limits with data collected following initiation of the testing program to evaluate water quality

during the testing program and compliance with the conditions of this waiver. Data shall be presented in tabular format and compliance with the conditions of Waiver Resolution No. _____ shall be discussed in detail;

7. Copies of laboratory analytical report(s) for injection water and groundwater monitoring; and

8. A calibration log verifying calibration of all hand held monitoring instruments and devices used to comply with the prescribed monitoring program.

A letter transmitting the self-monitoring reports shall accompany each report. Such a letter shall include a discussion of non-compliance and other concerns found during the reporting period, and actions taken or planned for addressing noted concerns, such as operation or facility modifications. If the discharger has previously submitted a report describing corrective actions and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory. The transmittal letter shall contain a statement by the discharger, or the discharger's authorized agent, under penalty of perjury, that to the best of the signer's knowledge the report is true, accurate and complete.

The Discharger shall implement the above monitoring program as of the date of this Order.

Ordered by: _____
THOMAS R. PINKOS, Executive Officer

_____
(Date)

GJC: 21-Jul-05